Preference and Behaviour Change Regarding Selected Performance-Enhancing Anabolic Androgenic Substances and Steroids in the Context of the Global COVID-19 Pandemic

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BACKGROUND: In December 2019, the Chinese government reported patients with viral pneumonia caused by a new beta coronavirus in Wuhan. In a very short time, the virus spread around the world, causing a global pandemic referred to as COVID-19. The situation escalated and states resorted to implementing strict social distancing and isolating measures. **AIM:** The main aim of the article was to determine whether there could be a relationship between a potential interest in information retrieval and a subsequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic in the context of the size of the respondent's town or village, their years of training, and whether or not the respondents have children. **METHODS:** Selected scientific methods, such as analysis, synthesis, induction, and deduction, were used to process the secondary and primary findings. **SAMPLE:** The research sample consisted of 127 respondents from the Czech Republic. The snowball method was employed for data collection. **RESULTS:** The results of the research in our case showed that there is no statically significant relationship between a change of preferences and behaviour regarding selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and the size of the respondents' town on the basis of its population, or the number of years of training of the respondents. However, it was found that whether or not the respondents have children has an impact on possible changes in their preferences and behaviour.

Keywords | Czech Republic – Fitness Centre – Global COVID-19 Pandemic – Selected Performance-Enhancing Anabolic Androgenic Substances and Steroids – Sports

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1 INTRODUCTION

As reported by Lu et al. (2020), in December 2019, the Chinese government reported patients with viral pneumonia caused by a new beta coronavirus in the city of Wuhan. The World Health Organization named it a new coronavirus from 2019 (2019-nCoV). As of January 26, 2020, more than 2,000 cases of 2019-nCoV infection had been confirmed, most of which involved people living in or visiting Wuhan. Human-to-human transmission was also confirmed.

This deadly virus began to spread worldwide with dramatically high morbidity and mortality and became known as COVID-19 (Pradhan et al., 2020).

Therefore, immediate action was needed to curb this catastrophic situation, leading to isolating and quarantine measures in many countries. This was considered to be the most effective way to break the chain of transmission (Shereen et al., 2020).

As claimed by Jiménez-Pavón et al. (2020), strict isolation policies and lockdowns have led, on the one hand, to a certain slowdown in rapidly spreading infection, but, on the other hand, to a reduction in the physical activity of the population and an increase in food intake as a result of their having more leisure time. It is well known that the long-term effects of these two conditions can lead to metabolic and psychological disorders.

The individual measures provoked various kinds of reaction and acceptance, subsequently affecting the functioning of the entire society and the whole world in all areas of life, from social to leisure and sports (Lim, 2021; Lim & Pranata, 2021).

It is becoming clear that the global COVID-19 pandemic has brought a new reality to all areas, including sport. Closures of gyms, fitness centres and swimming pools and postponement of sports events (the Olympics, competitions, matches, tournaments, etc.) together with the need to observe isolation, quarantine, and social distancing, as well as restrictions on outdoor activities and exercise or the impossibility of routine training in training environments, etc., were among the major stressors for both professional and non-professional athletes. Ultimately, these could have physical, psychological, and behavioural consequences for people around the world (Lim, 2021; Schinke et al., 2020).

Hammami et al. (2020) add that both elite and recreational athletes in Belgium were encouraged not to exercise intensively during lockdown, and to take particular care of their mental and physical health, while in China, citizens were actively encouraged to exercise in their homes during lockdown.

Apparently, each state coped with the global COVID-19 pandemic individually regarding sports and the physical activity of the population. However, now, as the global COVID-19 pandemic is subsiding, the desire to use various types of anabolic androgen performance-enhancing substances and steroids may occur in both professional and non-professional athletes in order to improve their current athletic performance or their personal image.

Alharbi et al. (2019) mention that the use of anabolic androgenic substances and steroids by professional and non-professional athletes is a growing public health issue worldwide.

Anabolic androgens and steroids are a group of hormones that includes the natural male hormone testosterone and its chemically synthesized derivatives. These hormones have varying degrees of anabolic and masculinizing properties. Initially, anabolic androgenic substances and steroids were developed for clinical use, for cases of reproductive dysfunction, breast cancer, and anaemia. However, they quickly gained popularity in the non-medical field, especially in sports, thanks to their effect of increasing performance and increasing muscle mass and strength (Christoffersen et al., 2019).

Singhammer (2013) states that anabolic androgenic substances and steroids are mainly a male phenomenon among adolescents or elite athletes. However, their use is not limited to adolescents, but also adults. It is mostly men who have some experience with these substances. Among men in the Scandinavian countries, the use of these substances was determined at 1.8–2.9%.

Sagoe et al. (2014) claim that the lifetime prevalence of anabolic androgen and steroid abuse worldwide is 6.4% in men and 18.4% in non-professional athletes.

Regarding performance-enhancing anabolic androgenic substances and steroids, Horwitz et al. (2018) and Klötz et al. (2010) claim that their use is associated with a number of sometimes irreversible health problems and psychiatric side effects, such as increased aggression, hostility, mood swings, and the like.

On the other hand, Cohen et al. (2007), Ip et al. (2011), and Murray et al. (2016) present the reasons why especially adolescents and men become not only short-term, but also long-term users of performance-enhancing anabolic androgenic substances and steroids, used in clearly defined cycles. These reasons include (a) increasing the individual's self-confidence; (b) enhancing one's personal image, which represents their aesthetic, physical, and visual appearance; (c) improving current sports performance; (d) increasing muscle mass, endurance, and strength.

From the legal point of view, in the Czech Republic all cases and facts are resolved in accordance with the New Criminal Code (Act No. 40/2009 Coll.), in particular in accordance with Sections 288 and 289.

The article focuses on determining the existence of a possible change in preferences and behaviour regarding selected performance-enhancing anabolic androgenic substances and steroids in the context of the global COVID-19 pandemic. These possible changes in the preferences and behaviour of individuals could most probably be linked to the desired improvement of their current sports performance or personal image after the end of the global COVID-19 pandemic, even though such substances are banned in the Czech Republic and harmful to human health. The article consists of a total of five parts. After the presentation of an introduction to the issue under research, the theoretical

background is presented, followed by the research goals, methodology, and data. The fourth part of the article presents the identified primary data and discussion. The final part is a conclusion that summarizes the essential results and information.

2 THEORETICAL BACKGROUND

As reported by Shereen et al. (2020) and Jiménez-Pavón et al. (2020), at the end of 2019, a new coronavirus broke out in Wuhan, a growing business centre in China, killing more than 18,000 people and infecting more than 70,000 individuals during the first 50 days of the epidemic. Coronavirus 19 (COVID-19) proved to be a highly transmissible and pathogenic viral infection caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which caused a global pandemic despite the strategies adopted by the Chinese government to curb the epidemiological phenomenon, and which led to a profound and dramatic loss of human lives.

Boserup et al. (2020), Ding et al. (2021), and Maringe et al. (2020) argue that, in an effort to prevent the spread of the virus, most governments around the world have taken measures such as limiting physical and social contact and travel and imposing lockdowns. Although these measures can be effective in managing the spread of the virus, they also have a profound global impact on society as a whole, leading to social, financial, and psychological consequences. As the authors agree, these measures have also had a negative impact on public health, such as postponing operations, suspending various types of screening, such as for cancer, an increase in domestic violence, reducing the physical activity of the population, and the associated increase in body fat or problems associated with the mental health of individuals.

Schinke et al. (2020) further argue that the changes associated with the global COVID-19 pandemic have brought many restrictions to the sports industry, professional and non-professional athletes, personal trainers, coaches, sports psychologists, and the like, as well as challenges and opportunities regarding sports performance, physical activity, and health.

For example, Zhang et al. (2020) consider it interesting to examine these challenges and opportunities in the context of various population groups on the basis of selected segmentation criteria. They looked into the effects of the global COVID-19 pandemic in adolescents living in large cities in China regarding their mental health and quality of life.

However, it is already clear that the return of athletes to standard routine training in a training environment may not be easy and immediately efficient and effective. Not all athletes had the chance to participate in physical activity and the impossibility of training could have led to (a) a decrease in their physical abilities (speed, endurance, strength); (b) reduction of muscle mass; (c) an increase of body fat content; (d) insomnia and depression resulting from social distance and isolation policies; (e) loss of acuity, or (f) worsened immunity (Halabchi et al., 2020; Chen et al., 2020; Jukic et al., 2020).

The above shows that athletes, whether elite or recreational, are rather likely to want to return to their pre-pandemic form and performance, and subsequently also strive for records or better results once the extensive social distance and isolation policies have been lifted. It is obvious that this goal may not be attainable soon enough after such a lengthy interruption of strength training. For this reason, a desire for change may occur in the preferences and behaviour of both professional and non-professional athletes regarding harmful and banned performance-enhancing anabolic androgenic and steroid substances.

In this context, Horwitz et al. (2018) report that performance-enhancing anabolic androgenic substances and steroids provide a relatively quick way to achieve muscle growth and improve the performance and personal image of an individual. These substances are used in sports, not only among elite athletes but also recreational ones.

Alharbi et al. (2019), Rasmussen et al. (2018), Rasmussen et al. (2016), and Van Amsterdam et al. (2010) and many others argue that when anabolic androgenic substances and steroids are used for non-medical purposes, they are not without side effects, risks, or complications to the individual's health. These substances are associated, inter alia, with (a) hormonal disorders; (b) gynecomastia; (c) testicular dysfunction or shrinkage; (d) infertility; (e) cardiomyopathies; (f) side effects on blood pressure; (g) acne; (h) the occurrence of neoplastic, hepatobiliary, and kidney diseases; (i) impotence, decreased libido, and other sexual disorders; (j) retaining fluids; (k) jaundice; (l) breast tumours; (m) prostate tumours; (n) the voice changing in women; (o) increasing body hair; (p) an increased incidence of dental caries, etc.

Horwitz et al. (2018) also add that the misuse of anabolic androgens and steroids is linked to individual and societal costs. Users of anabolic androgens and steroids have an increased risk of death and significantly more hospitalizations compared to routine medical examinations or check-ups. Side effects that are likely to be caused by anabolic androgens and steroids, such as gynecomastia and infertility, are very common in the population.

However, the New Criminal Code (Act No. 40/2009 Coll.), especially Sections 288 and 289, stipulates that the use of anabolic androgenic substances and steroids is prohibited and punishable by imprisonment.

3 RESEARCH OBJECTIVE, METHODOLOGY, AND DATA

The article deals with the sports sector of exercising, working out, and fitness in the context of the global COVID-19 pandemic in gym or fitness centres attendees, who may be professional or non-professional athletes. The article also aims to determine whether, as a result of the extensive social distancing and isolating measures in the Czech Republic, there could be a change in preferences and behaviour regarding selected

banned performance-enhancing anabolic androgenic substances and steroids.

As a result of the global COVID-19 pandemic, such a change in preferences and behaviour in connection with selected performance-enhancing anabolic androgenic substances and steroids would seem probable, as these substances allow a relatively rapid increase in muscle mass or improvement of an individual's personal image.

The authors of the article wish to emphasize that their entire research is viewed purely hypothetically. Thus, in no case do they internally motivate or promote the use of banned and harmful anabolic androgenic performance-enhancing substances and steroids.

The respondents were reminded at the beginning of the questionnaire survey that: (a) the research survey does not serve to motivate or promote any use of banned and harmful anabolic androgenic substances and steroids; (b) the research investigation is viewed purely hypothetically, i.e. how their preferences and behaviour would change if these substances were allowed; (c) the research is anonymous and voluntary.

As the research is of an extensive nature, this article presents only some of the findings, which form part of the entire research study.

The main aim of the article was to determine whether there is a statistically significant relationship between a potential interest in information retrieval and a subsequent possible change in preferences and behaviour regarding selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic in the context of the size of the respondents' town or village, the number of years they have been training for, and whether or not the respondent has children. A partial goal of the article was to find out whether the respondents would know where to obtain the selected performance-enhancing anabolic androgenic substances and steroids, were they not illegal and harmful to one's health.

Research question 1: Is there a statistically significant relationship between a potential interest in information retrieval and a consequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and the size of the respondents' town or village?

Research question 2: Is there a statistically significant relationship between a potential interest in information retrieval and a consequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and the number of years the respondents had been training for?

Research question 3: Is there a statistically significant relationship between a potential interest in information retrieval and a consequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and whether the respondents do or do not have children?

Research question 4: What are the sources of supply of selected performance-enhancing anabolic androgenic substances and steroids?

The data collection took place online from May to June 2021 using a questionnaire survey, which was structured and anonymous. Prior to large-scale data collection, a pre-test was conducted on a sample of ten respondents. Because of the sensitivity of the research topic, the snowball method was used to select respondents.

The research began with attendees of fitness centres. These were approached and asked to participate in the research. If they agreed to participate, they were further informed about the research guidelines. Finally, they were asked to share an online questionnaire survey among individuals who they know also actively work out and attend fitness centres. To eliminate distortion, effort was made to select a heterogeneous initial research sample based on geographical, demographic, and behavioural segmentation.

For the geographical segmentation, a five-point system of the size of a town or village according to the number of inhabitants was used. It was up to 9,999 inhabitants, 19,999 inhabitants, 49,999 inhabitants, and 99,999 inhabitants, and 100,000 and more inhabitants.

The questionnaire survey consisted of several consecutive research parts. The total number of respondents was 127, and the answers from these respondents were further used for the purposes of mathematical-statistical processing. To verify the defined research questions, Pearson's chi-square test was used to determine whether there is a relationship between the selected statistical features. The null hypothesis is rejected if the p-value is lower than the standard level of significance (usually 0.05, i.e. 5%). The Microsoft Excel 2013 spreadsheet processor and IBM SPSS Statistics 23 statistical software were used to analyse the collected primary data.

4 RESULTS AND DISCUSSION

The structure of the respondents who were addressed and participated in the research is presented in the table below *(Table 1).*

A total of 127 respondents participated in the research, of whom 96.06% were men. The most represented age group was from 20 to 29 years (70.08%). On the basis of the size of the town or village, it can be argued that the respondents were from larger towns or municipalities in the Czech Republic. The number of years they had been training for ranged mostly from four to six years (63.78%). As these were rather young respondents, they tended to be childless (53.54%).

Research question 1: Is there a statistically significant relationship between a potential interest in information retrieval and a consequent possible change in preferences and behav-

Table 1 | The structure of the respondents who were addressed (authors' own processing)

Sex	**Absolute frequency**	**Relative frequency (%)**
Female	5	3.94
Male	122	96.06
Total	**127**	**100**
Biological age	**Absolute frequency**	**Relative frequency (%)**
15–19	5	3.94
20–29	89	70.08
30–39	17	13.39
40 plus	16	12.6
Total	**127**	**100**
Size of town or village	**Absolute frequency**	**Relative frequency (%)**
0–9,999	4	3.15
10,000–19,999	8	6.3
20,000–49,999	28	22.05
50,000–99,999	44	34.65
100,000 and more	43	33.86
Total	**127**	**100**
Years of training	**Absolute frequency**	**Relative frequency (%)**
0–11 months	2	1.57
1–3 years	9	7.09
4–6 years	81	63.78
7–9 years	28	22.05
10 years and more	7	5.51
Total	**127**	**100**
Number of children	**Absolute frequency**	**Relative frequency (%)**
0	68	53.54
1	12	9.45
2	42	33.07
3 and more	5	3.94
Total	**127**	**100**

iour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and the size of the respondents' town or village?

The evaluation of research question 1 was performed using Pearson's chi-square test, where the p-value is higher than the standard value of significance, i.e. .05. The null hypothesis is thus not rejected at the level of significance of 5%. In this case, it can be argued that the size of one's town or village categorized by population does not affect the potential interest in information retrieval and subsequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic ($X^2 = 3.905$, $df = 12$, $p = .985$).

Research question 2: Is there a statistically significant relationship between a potential interest in information retrieval and a consequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and the number of years the respondents had been training for?

Pearson's chi-square test was used to answer research question 2. On the evidence of the research that was performed, it can be said that the p-value is equal to .515. This means that the p-value is higher than the standard level of significance. This means that the null hypothesis is not rejected at the 5% significance level. It can thus be concluded that the number of years the respondents had been training for does not affect the potential interest in information retrieval and subsequent possible change of preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic ($X^2 = 11.165$, $df = 12$, $p = .515$).

Research question 3: Is there a statistically significant relationship between a potential interest in information retrieval and a consequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and whether the respondent does or does not have children?

Pearson's chi-square test was used to verify research question 3. The research showed that the p-value is lower than the usually defined significance value of 5%. Therefore, it can be stated that there is a statistically significant relationship between the potential interest in information retrieval and the subsequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and whether the respondents have or do not have children (X^2 = 48.406, df = 9, p < .05). Using Cramer's V, the strength of this relationship was investigated further. We can speak of a weak relationship since the value of the strength of this dependence is 0.252.

Research question 4: What are the sources of supply of selected performance-enhancing anabolic androgenic substances and steroids?

The research also sought to answer the question of whether the respondents (n = 38) who stated that they would change their preferences and behaviour regarding the selected performance-enhancing anabolic androgens and steroids after the global COVID-19 pandemic know where or how they could obtain the banned and harmful substances in question. They were given a choice of the following alternatives: (a) a personal trainer or coach; (b) a friend; (c) purchase on the internet or via an e-shop; (d) a doctor; (e) another option. The respondents could indicate more alternatives or provide their own answer. The table *(Table 2)* presents the sources of supply of selected performance-enhancing anabolic androgenic substances and steroids according to the respondents who participated in our research.

On the basis of the table *(Table 2)*, it can be stated that the most common possible source of supply of selected performance-enhancing anabolic androgenic substances and steroids was online purchase. The second most common option was a friend, then a personal trainer or coach. The penultimate answer was a doctor and the last one was the 'other' option.

Table 2 | Possible sources of supply of selected performance-enhancing anabolic androgenic substances and steroids (authors' own processing)

Sources of supply of selected performance-enhancing anabolic androgenic substances and steroids	Absolute frequencies
Online shopping	30
Friend	23
Personal trainer, coach	18
Doctor	6
Other	4

The topic of the article is a possible change of preferences and behaviour regarding selected performance-enhancing anabolic androgenic substances and steroids in the context of the global COVID-19 pandemic. It can be said that there is not much research, studies, and the like directly in this research area. The results of the research by Kindlundh et al. (1999) argue that there is a relationship between the size of one's town or village according to its population. These researchers conducted studies in men living in Sweden and concluded that men living in large cities were more interested in the use of performance-enhancing anabolic androgenic substances and steroids than men living in small towns or rural areas. The findings of Whitehead et al. (1992) and Yesalis et al. (1989) confirm the results of our research. These authors claim that the size of one's town or village according to its population does not affect the use of selected performance-enhancing anabolic androgenic substances and steroids.

Beck et al. (2021) looked into urban and rural residents in the United States before and after the COVID-19 pandemic and concluded that non-rural residents showed milder but more intense physical activity during the pandemic. This finding could serve as an assumption that after the pandemic, non-rural residents will be much more interested in exercising in fitness centres than residents of rural or small towns.

Singhammer (2013) looked into women and men working out in fitness centres in cities in Denmark and their attitudes to the issue of anabolic androgens and steroids. A total of 23 participants (1.8%) reported that they had active experience with anabolic androgenic substances and steroids, 104 (5.3%) stated that they had considered using these substances, and 900 (93%) had never considered using these substances.

Striegel et al. (2006) conducted a survey in Germany of 113 fitness centres, where 13.5% of the respondents admitted to having experience with harmful anabolic androgenic substances and steroids. The use of these substances was positively related to the number of the years or the frequency of training. It was negatively related to the level of education and alcohol intake. These findings are in conflict with our research. In our case, the number of years of training does not affect the interest in performance-enhancing anabolic androgenic substances and steroids.

The non-medical use of anabolic androgenic substances and steroids poses many risks, including infertility and erectile dysfunction and impotence in men. These previous findings lay behind another research question, which was verified in our research. We concluded that there is a relationship between whether the respondents do or do not have children and their interest in performance-enhancing anabolic androgenic substances and steroids.

Rasmussen et al. (2016) examined 70 current and former users of anabolic androgenic substances and steroids and found that their testicular volume was significantly lower compared to non-users. Testosterone production was low in former users even years after discontinuation of anabolic androgenic substances and the use of steroids, which may have a negative impact on fertility.

Martin et al. (2021) conducted research across England to examine the differences in the impact of the global COVID-19 pandemic between the sexes; winter, summer, and year-round sports; team and individual sports; age, coping strategies, and feelings regarding returning to sports. The researchers found that the negative impact of restrictions on sports was perceived more by women than by men, especially by women who engaged in winter and team sports. Another finding of this research is that the respondents realised the loss of their physical condition after returning to exercise. Their coping strategies and feelings about returning to sport after the global COVID-19 pandemic included acceptance (46%), humour (12%), or the use of selected anabolic androgenic substances and steroids (7%). It can be said that the results of this research in a way support our own research related to a possible change in preferences and behaviour in connection with selected anabolic androgenic substances and steroids.

Alharbi et al. (2019) conducted a study in 20 gyms and fitness centres in Riyadh to map the knowledge and attitudes of 482 respondents regarding selected anabolic androgenic substances and steroids. Of these, 29.3% of the participants reported using anabolic androgenic substances and steroids, while the majority (53.5%) said they had heard of their use mostly through friends. Most of the study participants reported awareness of the effects of anabolic androgens and steroids on muscle mass, body weight, and muscle strength (53.2%, 51.1%, and 45.5%). In comparison, a higher proportion of the study participants were unaware of the side effects of the use of anabolic androgenic substances and steroids.

Alharbi et al. (2019) also dealt with the possible sources of supply of selected performance-enhancing anabolic androgenic substances and steroids, concluding that the most common sources of supply of these substances were sports coaches (49%), then friends (30.6%), fitness shops (8.2%), trainers (8.2%), and doctors (4.1%).

Albaker et al. (2021) dealt in their research with the adverse effects and impacts of anabolic androgenic substances and steroids on fitness centre attendees in Saudi Arabia, concluding, among other things, that the main sources of supply of the anabolic androgenic substances and steroids they selected were personal trainers and friends (75.2%), while the research participants were unaware of the possible adverse effects of their use.

Our research focused on whether the respondents know where or how they could obtain these banned and harmful substances. The most represented possible source was purchasing via the internet or an e-shop, but the other options are in line with the research of the above authors.

5 CONCLUSIONS

The article deals with the sports sector, especially with the issue of a possible preference and behaviour change in connection with selected performance-enhancing anabolic androgenic substances and steroids in the context of the global COVID-19 pandemic. Such a change in preferences and behaviour could occur mainly as a result of a relatively rapid increase in muscle mass, possible improvement in sports performance or endurance, and also an improvement of one's personal image.

The main aim of the article was to discover whether there could be a relationship between a potential interest in information retrieval and a subsequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic in the context of the size of one's town or village, the number of years of training, and whether the respondents do or do not have children. A partial aim of the article was to find out whether the respondents would know where the selected performance-enhancing anabolic androgenic substances and steroids could be obtained, were they not banned and harmful to one's health.

Through a literature search, four research questions were defined, to which answers were sought.

The results of our research yielded the following findings: (a) the size of one's town or village, based on its population, does not affect the potential interest in seeking information and consequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic; (b) the number of years of training of the respondents does not affect their potential interest in seeking information and a consequent possible change in preferences and behaviour regarding selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic; (c) there may be a statistically significant relationship between the potential interest in information retrieval and consequent possible change in preferences and behaviour in relation to selected performance-enhancing anabolic androgens and steroids before and after the global COVID-19 pandemic and whether the respondents have or do not have children. In our case, we can speak of a weak relationship. The research also shows that the most common possible source of supply of selected performance-enhancing anabolic androgenic substances and steroids was online purchase, according to the respondents. A friend was mentioned as another source of supply, then a personal trainer or a coach, and then a doctor.

On the evidence of the literature search, our research, and other research, it is likely that the global COVID-19 pandemic may have changed the preferences and behaviour of professional and non-professional athletes in relation to selected performance-enhancing anabolic androgenic substances and steroids. The value and the contribution of this article lie mainly in drawing attention to this issue, as it is a growing problem of public health worldwide. Undoubtedly, one of the limitations of the article is the low number of respondents. Other limitations include the fact that the research has so far been carried out in only one country, i.e. the Czech Republic, that the research used its own questionnaire survey, which limited the possibility of comparison, or that the questionnaire survey exists only in online form. However, despite these limitations, the article brings new facts and information that could be used in the preparation of further research on this issue.

Authors' contributions:
Conceptualization: JB, PS; Introduction and Theoretical background: PS, JB; Methodology and Results: JB, PS; Final edition: PS, JB. Both authors contributed to the article and approved the final version of the manuscript.

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The authors declare that they do not have any competing financial, professional, or personal interests from other parties.

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